

Implementing a National Lake Survey Decisions To Be Made & Proposal



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Objectives

- ▶ *The goal of the Lakes Survey is to address 2 key questions about the quality of the nation's lakes:*
 - ▶ *What percent of the Nation's lakes are in good condition for key indicators of ecological health and human activities?*
 - ▶ *What is the relative importance of key stresses?*
 - ▶ *What changes have occurred over time in lake quality?*



How to Address the Objectives?

- ▲ *Ecological Health -*
 - ▲ *Aquatic Life Use?*
 - ▲ *Biotic Integrity*
 - ▲ *Stressor Specific Biological Response*
- ▲ *Human Health –*
 - ▲ *Recreational contact?*
 - ▲ *Drinking water quality?*
 - ▲ *Tissue edibility?*



How to Address the Objectives?

(continued)

- ▶ *Relative Importance of Stressors – which ones?*
 - ▶ *Nutrient enrichment*
 - ▶ *Acidification*
 - ▶ *Chemical contamination in tissue*
 - ▶ *Non-native species*
 - ▶ *Riparian alteration*
 - ▶ *Bacterial & other pathogen contamination*
 - ▶ *Others?*



How to Address the Objectives?

(continued)

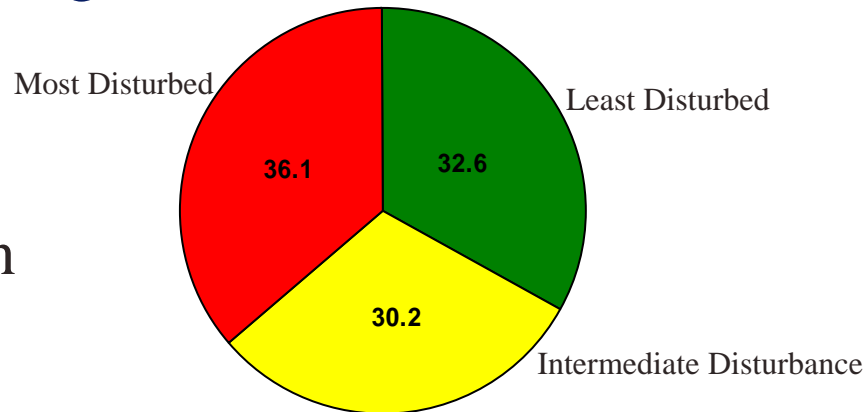
- ▶ *Focus in this workshop on endpoints and stressors of interest and target population.*
- ▶ *Focus in spring workshop on specific indicators, measurements and methods.*



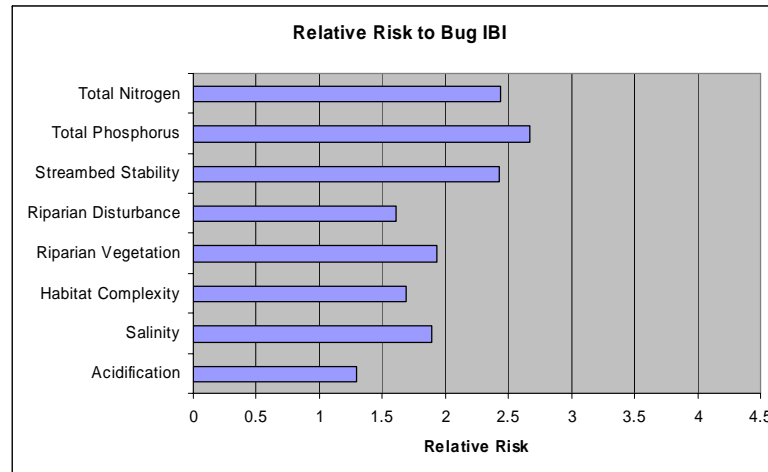
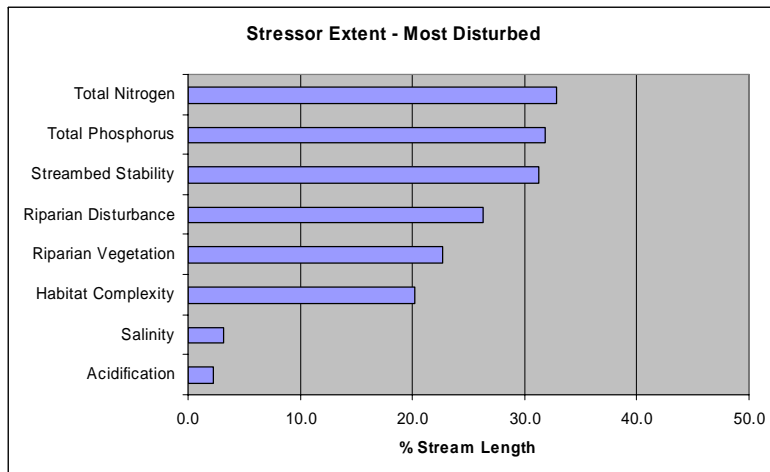
Example Assessment Objectives

Flowing Waters

Biotic Condition



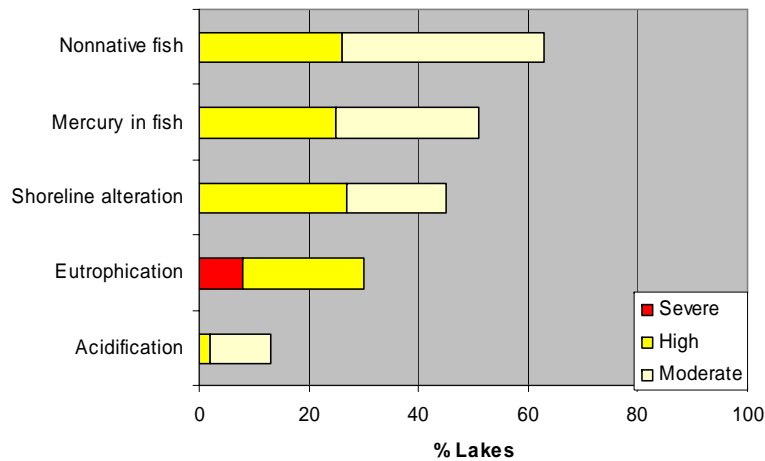
Relative Ranking of Stressors



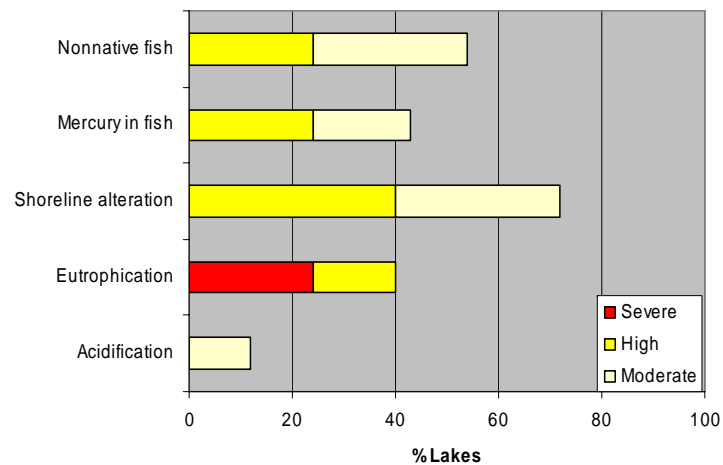
Example Assessment Objectives

Lakes

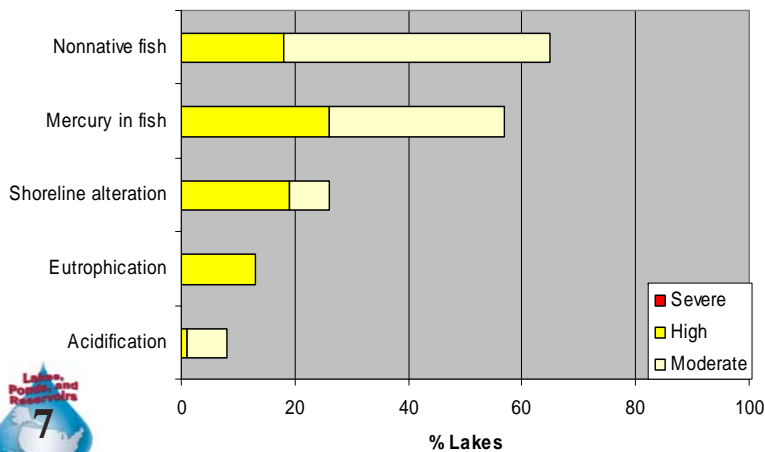
Northeast



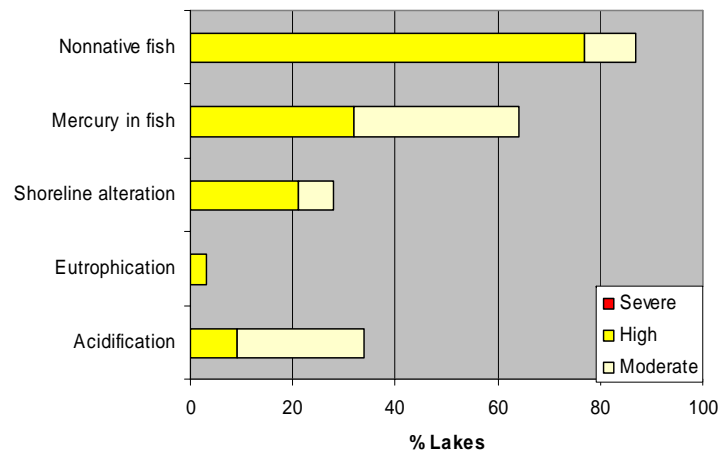
Lowlands



Highlands



Adirondacks



Refining the Objectives

Target Population

- ▶ *Target population – what “lakes” should the final assessment to refer to?*
- ▶ *What is a lake?*
 - ▶ *Origin – natural, man-made?*
 - ▶ *Size – how big or small to be considered a lake?*
 - ▶ *Need to provide an explicit definition that a field crew can use to decide if the waterbody is part of the “target population”*



Refining the Objectives

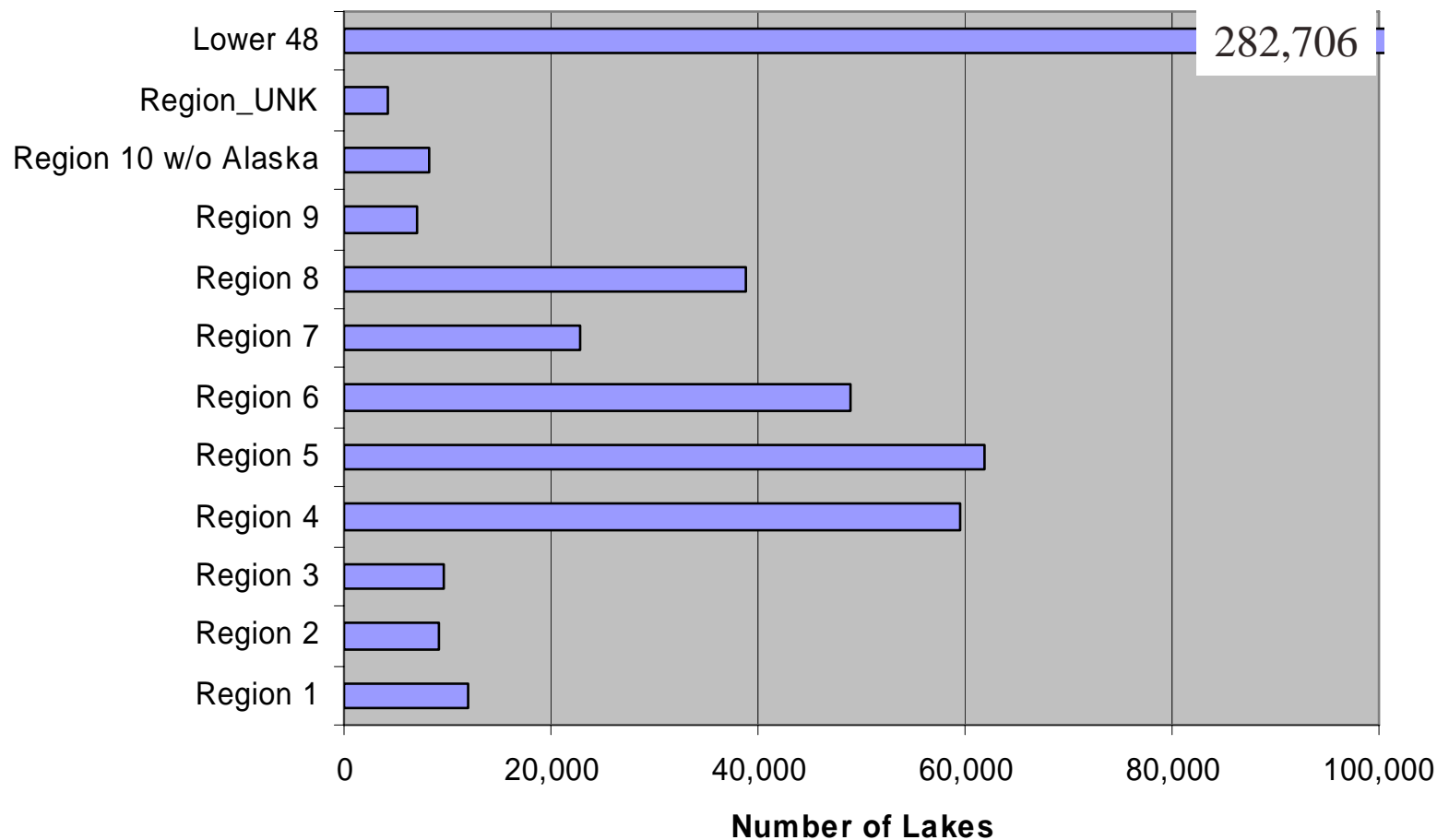
Target Population

- ▶ *Special subpopulations of interest?*
 - ▶ *e.g., lakes associated with different landuses?*
 - ▶ *Geographic subpopulations? – regional estimates in addition to national estimates*
 - ▶ *Special interest lakes that might be hand-picked for specific reasons, e.g., reference lakes, lakes with long term records, lakes from previous surveys and existing programs (NES, State/Tribal programs, NAPAP lake studies, Lake Fish Tissue Study)*



Lake Numbers by EPA Regions

(source – NHD)



Suggests that to get regional estimates, we will need to “stratify”

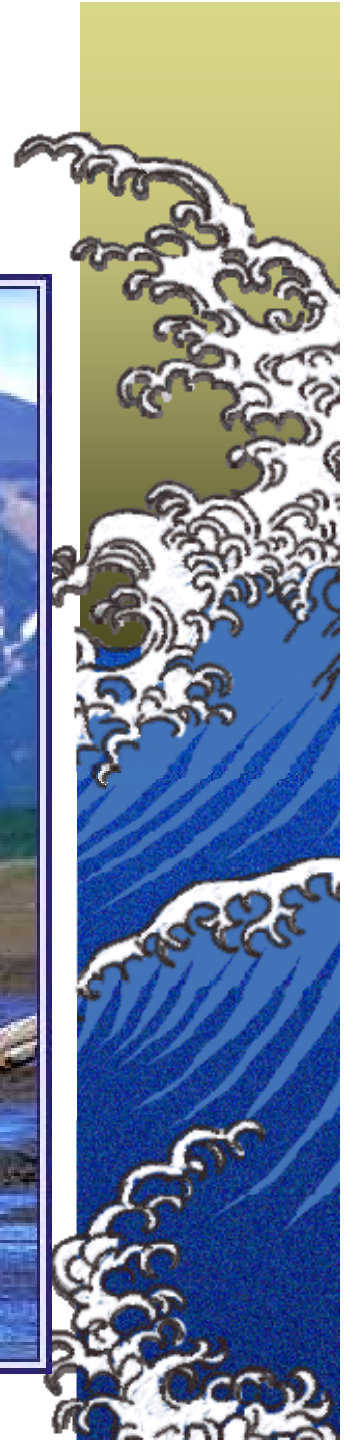
You've heard of the 700 lb. gorilla
in the closet...



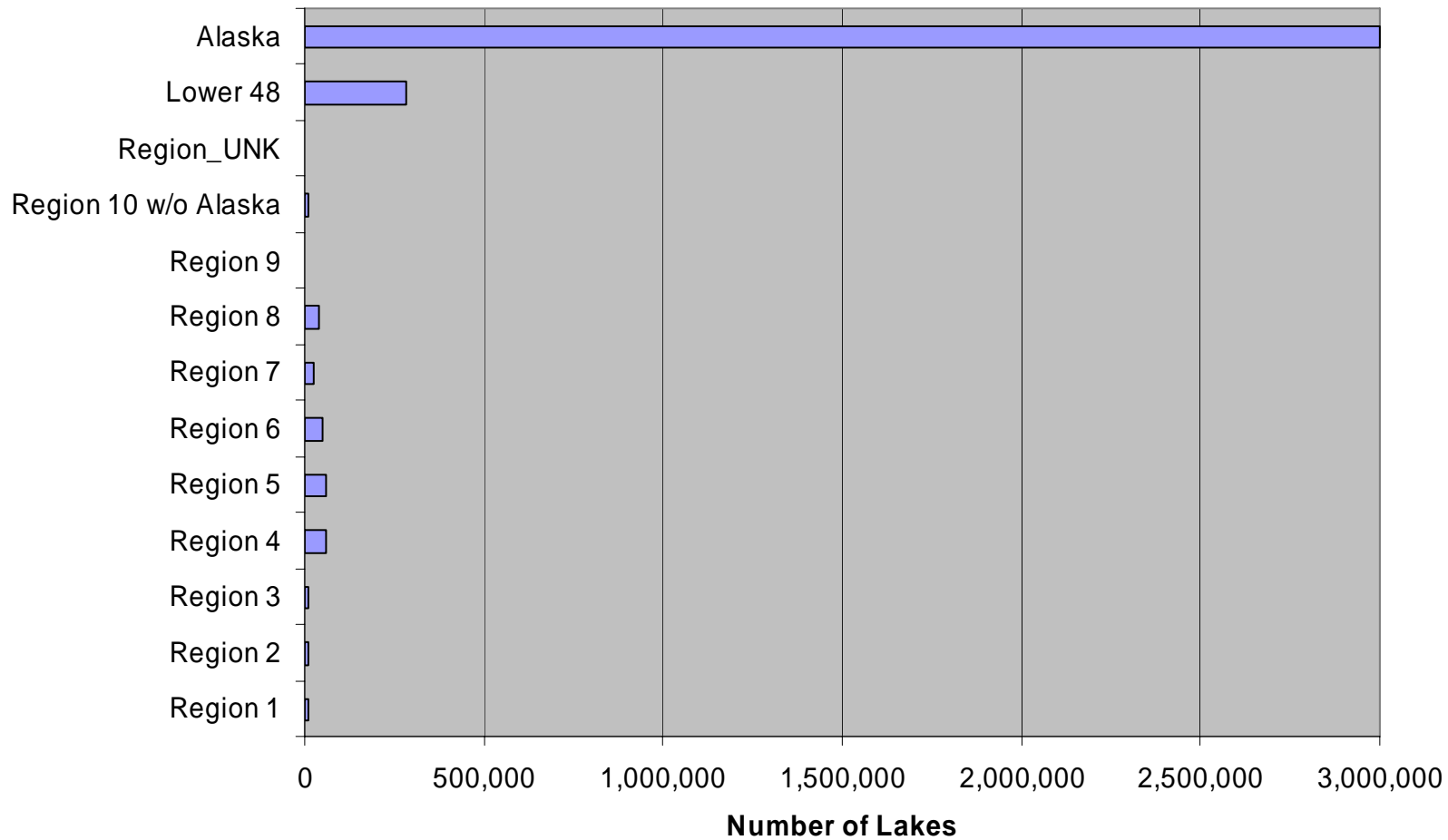
...We've got a 1,000 lb brown bear
and she's on the loose!!!



© Lynn Rogers



... Alaska!

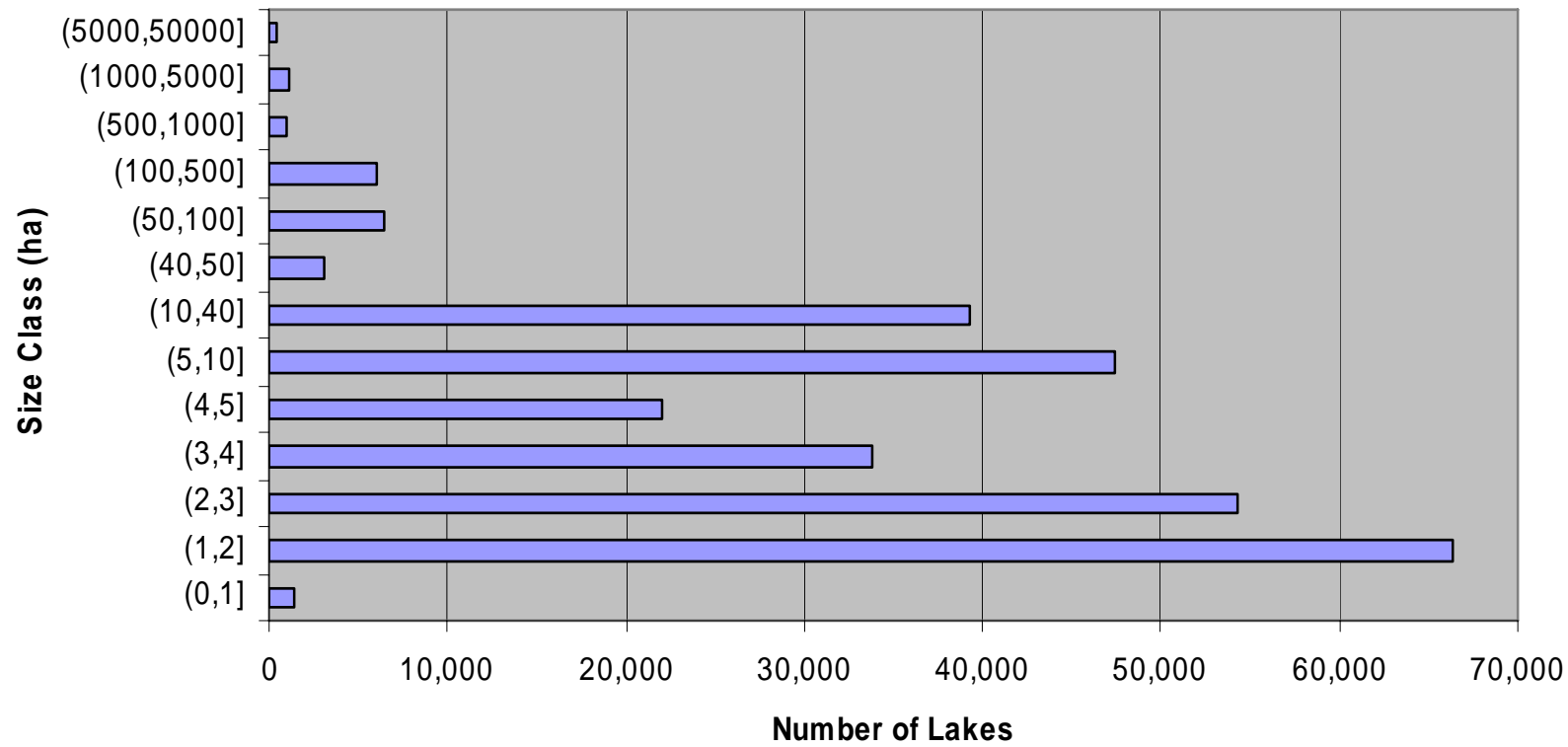


...and that's just lakes over 20 acres in size!!!



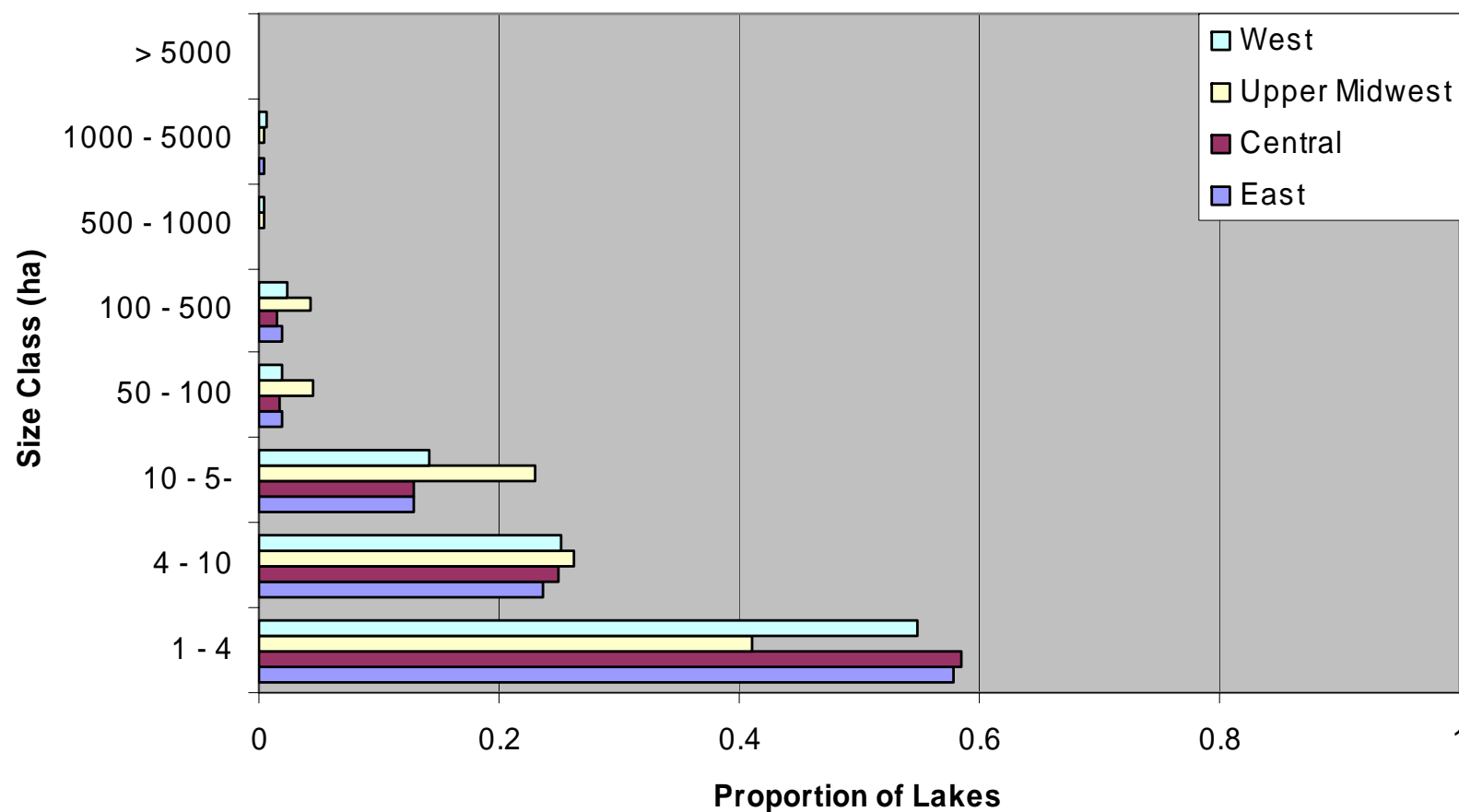
Size Classes

Lower 48 States by Size Class



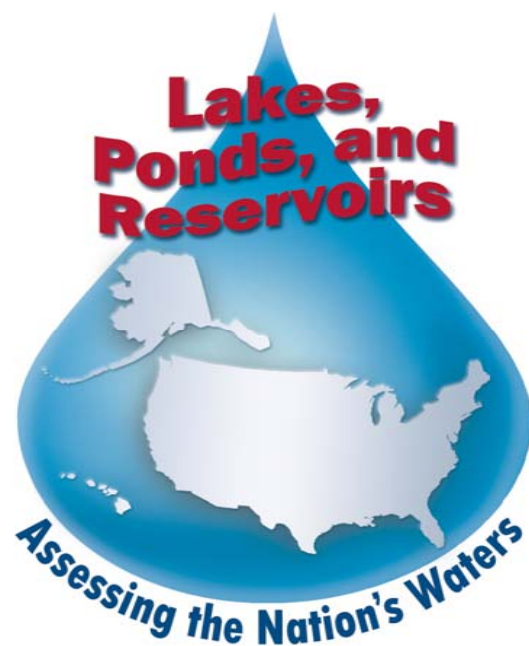
Clearly anything less than 1 hectare is not reliable

Proportion of Lakes by Size Class



Waterbodies in the 1-4 hectare class represent 40 -50% of lakes

Implementing a National Lake Survey Proposal



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Proposal

★ *Assessment Objectives*

★ *Stressor Comparisons – we know we can get this done*

- ★ *Nutrient enrichment*
- ★ *Acidification*
- ★ *Riparian alteration*
- ★ *Tissue contamination*

★ *Condition –*

- ★ *Biological Response to key stressors (e.g., phytoplankton response to nutrients) (we know this can be done)*
- ★ *Biotic Integrity (some evidence that this is doable – relies strongly on “reference sites”)*

(continued)



Proposal

(continued)

▲ *Lake – definition*

- ▲ *Natural and artificial lakes*

- ▲ *> 1 hectare in surface area* (additional details to separate from wetlands)

▲ *Target Population*

- ▲ *National and regional resolution (10-15 regions - ecoregions, federal regions and basins)*

- ▲ *“Stratify” by lake size, not for reporting purposes, but to ensure inclusion of larger lakes*

(continued)



Proposal

(continued)

- ▶ *Target Population (continued)*
 - ▶ *Include subset (at least 50) of the 800 lakes from 1970s NES for the purposes of looking at change in that group of lakes*
 - ▶ *Include set of lakes for “reference lakes”*
 - ▶ *Work with States and Tribes to have a subset of their high priority lakes sampled for same parameters but don’t count these against the 1,000 lakes*
 - ▶ *Include a subset (at least 50) of lakes from the Fish Tissue Survey*

(continued)



Proposal

(continued)

- ▶ *Select lakes by end of winter*
- ▶ *Use spring workshop to refine indicators, field and laboratory protocols.*
- ▶ *Issue funding packages in FY2006 so funding can be in hand to start recon, prepare for field season and to attend training*
- ▶ *Field survey in summer of 2007*

